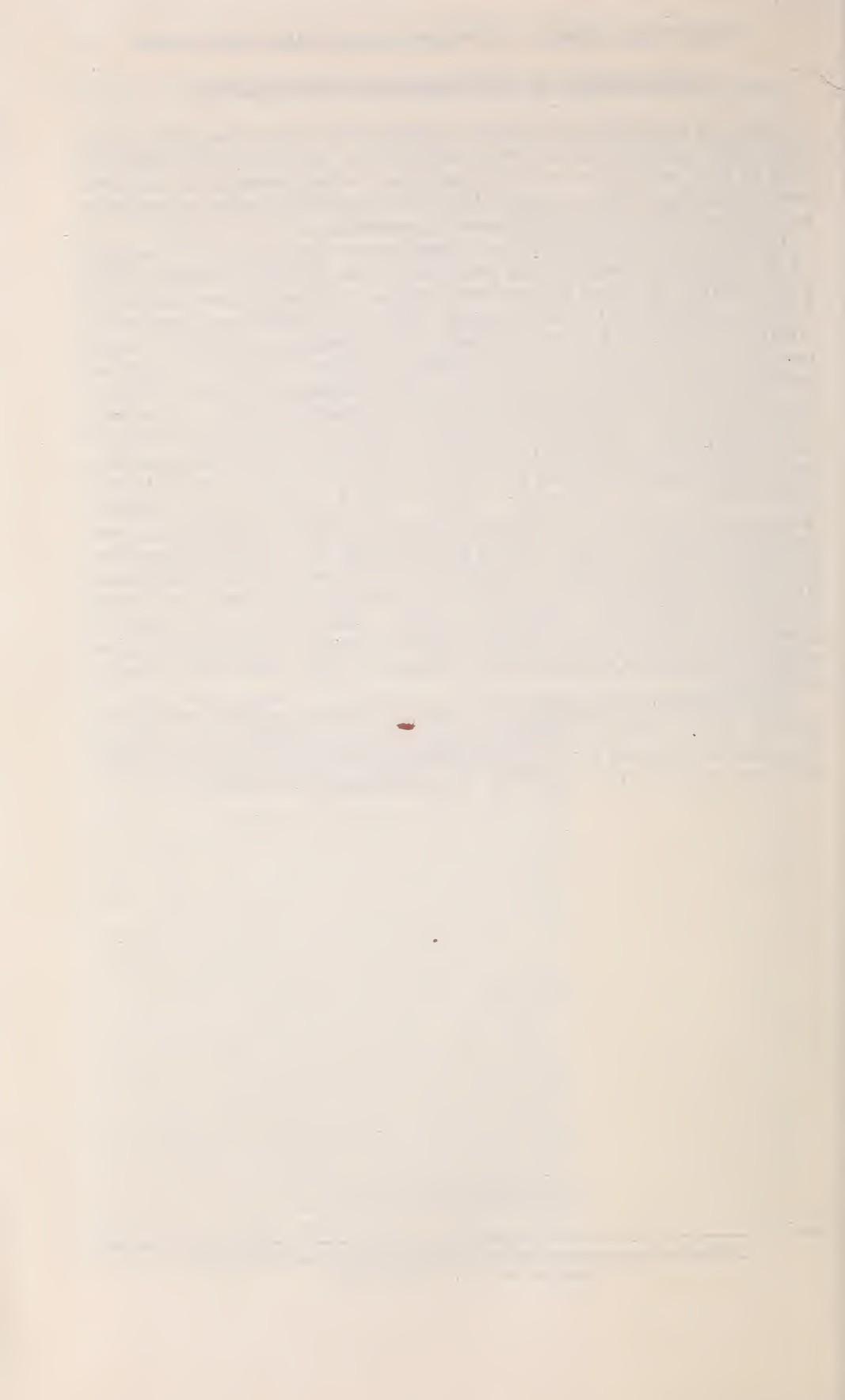


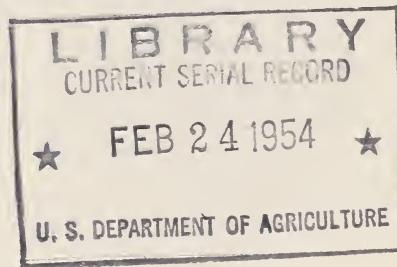
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# Report of the CHIEF OF THE BUREAU OF HUMAN NUTRITION AND HOME ECONOMICS



Agricultural Research Administration  
United States Department of Agriculture

1953



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# Report of the Chief of the Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, 1953

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UNITED STATES DEPARTMENT OF AGRICULTURE,  
Washington, D. C., September 15, 1953.

DR. B. T. SHAW,  
*Agricultural Research Administrator.*

DEAR DR. SHAW: I submit herewith the report of the Bureau of Human Nutrition and Home Economics for the fiscal year ended June 30, 1953.

Sincerely,

HAZEL K. STIEBELING,  
*Chief.*

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## INTRODUCTION

In nutrition and home economics, as in other fields of learning, there is growing recognition of the need to strengthen scientific foundations. The research program of the Bureau of Human Nutrition and Home Economics, in providing facts and principles that can be applied in improving family living and in using agricultural products more effectively in the home, contributes directly to the advancement of scientific knowledge. It also helps indirectly as the new and better research techniques developed in the course of its work are widely adopted in other laboratories.

The following pages give examples of latest research carried out within the Bureau's laboratories and by contract and cooperative arrangements with agencies in the States.

## RURAL FAMILY LIVING

### Levels of Living on Farms

During the past decade farm families have been achieving higher levels of living and coming closer to realizing the standard generally accepted in this country. Income gains and the availability of improved services—such as electricity, better schools, and other public services—have had an important influence on the emergence of a level of living among farm families approaching that of urban groups. But it still falls short in many respects. Information gained through studies of consumption of goods and services by rural families and of changes in income, condition of housing, and facilities tells a great deal about the areas in which greatest advances have been made and those in which more improvement is needed.

Contributing to such knowledge is a Bureau study of farm families in an important North Central farm State, Illinois, immediately after World War II. The report, prepared within the year, provides the most comprehensive picture available of farm family spending and saving since the war. It includes statistical tables dealing with all categories of consumption and savings, thereby providing material that can be used in appraising total family living. The average expenditure of cash for family living was found to be divided as follows: Food, 31 percent; housing and house furnishings, 24 percent; clothing, 17 percent; medical care, 7 percent; all other goods and services, 21 percent.

As part of this study, which was based on a cross-section of farm families of the State, comparisons were made with the year-to-year data from home accounts summarized by the Experiment Station of the University of Illinois. This was done to answer a question often raised: To what extent are account-keeping farm families representative of a total farm population? Wide differences in average economic level were revealed between the survey group and the account-keeping group. Differences in family composition between the two groups also created differences in their spending and saving patterns. But families of similar economic level and family type in the two groups tended to spend about the same amounts for family living. The findings from this comparison of the characteristics and spending habits of the two groups will make more useful the account book data gathered annually by several of the States.

The study in Illinois was one of a series begun by the Bureau in 1944 on rural family living in selected localities of the United States. The usefulness of this series has been enhanced by a recent analysis of related census data for the country as a whole and for major regions. The Bureau cooperated with other agencies—the Bureau of Agricultural Economics and the Bureau of the Census—in bringing together previously separated information on income, farm and family characteristics, housing and household equipment, and home food production practices of farm-operator families from the 1950 Censuses of Population, Housing, and Agriculture.

This study of 11,000 sample farms provides information, heretofore unavailable on a national basis, on levels of living of farm-operator families classified by the size of the farm business operated, family income, and tenure arrangements under which the farm is operated. The Bureau's portion of the study stresses housing facilities, the equipment that farm women have to work with, and home food production practices.

Among farm-operator families, problems of low income and poor housing were found to be most acute on small-scale commercial farms. These are the farms that had from \$250 to \$1,200 worth of farm sales, on which operators had less than 100 days of work off their farms during the year, and on which nonfarm income of the family did not exceed the value of farm sales. This group of farm operators includes about three-quarters of a million families. Two-thirds had family income under \$1,000. About three-fourths are in the South.

The dwellings of 30 percent of these small-scale commercial farmers were classed as dilapidated. Fewer than 20 percent had running water piped into the house, gas or electric ranges, or telephones. On the other hand, about 60 percent had electricity somewhere on the farm, about a third had electric washing machines, and slightly more had mechanical refrigerators.

Housing was somewhat better on the small part-time and residential farms, where farm income was supplemented by off-farm earnings and income of other kinds. These were not by any means all good houses, with 20 percent classed as dilapidated and only 40 percent having piped running water in the dwelling, but as a group they were better than the houses on the smallest farms where outside work did not supplement low farm income. Houses on the largest commercial farms scored highest, whether measured by the proportion not considered dilapidated, or the percentages with running water, other plumbing items, electricity, selected electrical equipment, mechanical refrigerators, gas and electric ranges, or telephones. But even on the largest commercial farms, where most of the dwellings of operators had electricity that could provide power for water systems, about 30 percent did not have hot and cold running water or other plumbing facilities.

Farm houses in the South were less well equipped and more often dilapidated than those in the North and West, as would be expected because of the concentration of small farms in the South. On the larger farms, however, the quality of housing did not differ much between the two regions.

Tenure differences in housing facilities were greater than could be explained by the level of family income. For example, in the North and West, nearly two-thirds of the houses occupied by owner-operators of commercial farms with family income over \$3,000 had hot and cold running water, compared with less than half of the tenant houses. In the South, on farms where family income was from \$1,000 to \$3,000, about 35 percent of the owners and about 15 percent of the tenants, excluding sharecroppers, had houses with running water.

## Sources of Farm Family Earnings

One evident reason for the changing pattern of living among families living on farms is the extent to which they derive cash earnings from nonfarm work. Turning to census data again, the Bureau saw possibilities for gaining light on the importance of this factor. A special analysis of census data on earnings in 1950 shows that only one-third of all families living on farms in the spring of 1951 fitted the pattern traditionally considered typical of the farm family; that is, one operating a farm and having no additional earnings. Even when families with earnings from farm wages were added, less than half of the families on farms derived their entire earnings from farming. On the other hand, one-sixth of the families living on farms got their cash earnings entirely from nonfarm work.

Important in the background are such factors as these: More and more factories are being built in rural areas. These offer employment opportunities which attract many farm family members, including farmers themselves. The industries also draw to the community new families, some of which settle on farms but without intent to do much, if any, farming. Meanwhile crowded living conditions in cities and good roads to outlying areas lead many city families to move out to farms within commuting range of their accustomed city work.

## NUTRITION RESEARCH

### Diets of American Women

Little has been known about the diet and nutritional condition of adults in this country, or the changes in their food habits as they grow older. There is increasing interest in such facts in view of the growing recognition of the role that food habits may play in delaying or hastening the disabilities of age.

Findings from recent studies on the kinds and quantities of food eaten by women point in one general direction—that food intake is surprisingly low. The Bureau obtained data on the food eaten in one day by 1,000 homemakers in 4 cities—Birmingham, Buffalo, Minneapolis-St. Paul, and San Francisco—as part of a recent survey of family food consumption. Although the food eaten in so brief a period may not be taken as typical of an individual's food habits, averages for this many women during 24 hours give a true picture for the group. To cite examples of findings:

Food eaten by these homemakers during 1 day provided an average of 1,780 calories and appeared in general to be adequate for their food energy needs as indicated by their weight in relation to height. Average consumption of calcium was considerably less than recommended as a dietary goal by the National Research Council. The homemakers got, on the average, about 0.6 gram per day as compared with the 1.0 gram recommended in 1948. The average amount of riboflavin, 1.3 milligrams, also fell below the recommended amount of 1.5

milligrams. Their diets came nearer to averaging recommended amounts of protein, iron, thiamine, niacin, and ascorbic acid. Best record for the group was for vitamin A, which averaged well above the recommended level of 5,000 International Units, though the range was great.

Older women least often had food that supplied recommended quantities of nutrients. They ate less and had diets of poorer nutritional quality than did the younger women. Diets of homemakers who held outside jobs did not differ much in nutritive value from those of women doing housework only.

Breakfasts, lunches, and dinners eaten away from home tended to provide more food energy and more protein and some other nutrients than corresponding meals eaten at home. This demonstrates the need in dietary surveys of taking into account the quantities of food eaten away from home. If the homemaker's pattern of eating larger meals when away from home is matched by men and children, it would raise somewhat the nutrient values heretofore estimated for family diets as a result of the usual surveys dealing with food for home use. And since high-income families eat out more than low-income families, the usual reports of family food consumption may have underestimated the effect of income on consumption of foods and nutrients.

The findings regarding women's diets in the 4 widely separated cities are in general agreement with results of research undertaken cooperatively with States of the North Central Region, which afford dietary data on more than 2,000 women 30 to 90 years of age. For example, the food eaten in a day by more than 1,000 Iowa women provided an average of 1,735 calories; 86 percent of the women had less than 2,400 calories, and 60 percent less than 1,800 during a 24-hour period. Food practices of these women differed among age groups—for each advancing decade, average intakes of calories and all nutrients decreased.

### Southern Food Surveys

Dietary information from families in three diverse farming areas of the South, obtained in cooperation with Southern Agricultural Experiment Stations, has many implications for the well-being of farm families, as well as for programs in agriculture and rural education. Diets of mountain-area families were found to be better nutritionally than those in the tobacco or in the cotton areas. The dietary level was greatly influenced by the kind and amount of home-produced food. For example, less than half of the families in the cotton area had home-produced milk during February to April—the period of the survey—and their purchases of milk were small. The proportion was not much higher in the tobacco area. Many farm families, especially in the lowest income groups, had less than 1 cup of milk per person per day, indicating a potential market for more milk if it could be supplied in low-cost forms.

The week's food supply of many of the families did not provide enough calcium, ascorbic acid, and vitamin A value to meet the allow-

ances recommended by the National Research Council. The diets of Negro families and of lower economic groups generally were most often and most seriously below the recommendations for calcium, vitamin A value, and ascorbic acid, and frequently supplied less than recommended amounts of protein and riboflavin. Largely because of the enrichment of white flour, bread, and degermed cornmeal and grits, and use of whole-ground meal in some areas, shortages of iron, thiamine, and niacin were seldom found. To improve the quality of these family diets more milk, potatoes and sweetpotatoes, more green and yellow vegetables, and more tomatoes, citrus fruits, or other good and dependable sources of ascorbic acid are needed.

During this survey, the Bureau had opportunity to compare the accuracy of two fact-finding methods, one more time-consuming and costly than the other. The two are: The record method, in which families cooperate by recording weight of all food on hand at the start and end of a week and all food brought home during the week; and the list recall method, in which homemakers are interviewed, with a reference food list, and asked to recall the kinds and quantities of food used in the week preceding. The analysis showed that, for the groups of families studied, both methods provided in general the same results. This test adds to the growing body of knowledge of efficient survey methods. The technical report of the survey includes a discussion of the problems encountered in using the two methods; this should be of value in conducting future studies of family food consumption.

### Fatty Acid Needs of Children

Understanding of human needs for the unsaturated fatty acids provided by the fats and oils in every day diets is being advanced by a Bureau-sponsored research contract with the University of Texas Medical Branch. From studies carried out on rats and dogs and from clinical observations on human subjects, it has been known that certain polyunsaturated fatty acids—particularly arachidonic, linoleic, and linolenic acids—have values beyond their contribution to food energy. They are nutritionally essential for normal structure of the skin.

The study in Texas has shown that quantities of linoleic and arachidonic acids in the blood serum of a group of well-nourished children were significantly higher than those in the serum of a group of malnourished children, some of whom showed poor capability to absorb fat. Of the total fatty acids in the blood serum of the well-nourished children, linoleic acid was found to make up approximately 31 percent, and arachidonic acid 13 percent.

It appears definite that children can be well-nourished, as far as fatty acids are concerned, when from 3 to 5 percent of the calories are derived from linoleic acid of dietary fats; the minimum requirement may be somewhat lower. Linoleic acid appears to be an important precursor of arachidonic acid in the body inasmuch as children apparently manufacture the needed arachidonic acid if their diets contain linoleic acid in adequate amounts. Some of the well-nourished children studied had diets that provided plenty of linoleic acid but only negligible amounts of arachidonic acid, but the quantities of arachidonic acid in their blood serum were normal.

This study with children was feasible because a semimicro method was developed which made it practicable for the first time to determine the amounts of these nutrients in small samples of blood.

### Amino Acid Requirements

Minimum amounts needed by young women of two of the essential amino acids in proteins—valine and threonine—have been determined in research done under contract at the University of Nebraska. Student volunteers ate semipurified diets containing a few natural foods and cornstarch, sugar, and fat, to which known amounts of vitamins, minerals, and amino acids were added.

All of the subjects attained nitrogen equilibrium, indicating satisfactory supply of protein to the body, when the daily diet included 550 milligrams of valine and provided adequate amounts of all other necessary factors. When this amount or more of valine was supplied and the amount of threonine was reduced, it was found that 184 milligrams of threonine were sufficient to prevent loss of body protein. These amounts, relatively small, indicate that persons who eat diets usual in this country are likely to get enough of these two amino acids. When human requirements are known for all essential amino acids, they will afford a basis for evaluating the importance of different proteins in diets.

Experiments at Beltsville with adult laboratory rats produced evidence that the kind of carbohydrate in the diet can influence the quantity of amino acids needed when protein intake is low and the essential amino acids are therefore in small supply. It took less of the essential amino acids to maintain nitrogen equilibrium and to prevent excessive fat in the liver when the carbohydrate in the experimental diets was corn dextrin rather than sucrose.

### Amino Acids in Vegetable Products

To learn more about the extent to which plant foods can help in supplying protein needs is one of the goals in the Bureau's protein chemistry research. Techniques have been developed which increase the accuracy of results from the newer microbiological assays of amino acids in plant foods containing a high proportion of complex carbohydrates. A way has been found of filtering out a still unidentified substance which can interfere with growth of test organisms after the protein molecule has been split by the acid hydrolysis procedure.

Extending work beyond the Bureau's laboratories at the Agricultural Research Center, a recent contract with the University of Arizona made it possible to assay selected vegetables from the Southwest for 10 essential amino acids. Amounts have been determined in fresh and dried blackeye peas, broccoli heads and stalks, raw and roasted peanuts, pinto beans, potatoes, spinach, and sweetpotatoes. When the proteins of these vegetables were compared with whole egg as an example of animal protein, the vegetable proteins were most frequently low in three amino acids—isoleucine, leucine, and methionine.

## FOOD QUALITY

### Cooking Mature Poultry

Small but mature Leghorn hens are often a problem in the poultry market. Shoppers tend to prefer meatier, younger chickens; many believe the meat of the Leghorn hens to be stringy and inferior; and inexperienced buyers are likely to fry the small birds with disappointing results. Since these hens culled from laying flocks represent a great deal of economical food, experiments were undertaken on home methods of cooking them. Results of steaming, simmering, and pressure-cooking have been compared, using Leghorn hens of 3 U. S. Department of Agriculture quality grades, some fresh-frozen and some held 7 to 9 months in frozen storage.

In general, chickens cooked by the three methods were about equally good in flavor and rated high—comparing favorably in eating quality with meat from Rhode Island Red hens. Palatability scores and mechanical tests indicated a tendency for meat from steamed and simmered Leghorn hens to be more moist and tender than meat from pressure-cooked hens.

### Turkey Flavor and Starting Rations

Widespread use of antibiotics in the starting diets of young turkeys, to speed growth and permit earlier marketing, has raised the question of the possible effects on the quality of the meat. In cooperative research with the Bureau of Animal Industry, turkeys fed on rations containing aureomycin were roasted and judged for palatability. Some birds were full-grown, others killed at fryer-roaster age. No differences in any palatability factors were noted between the birds receiving aureomycin and the controls.

Palatability scores showed, however, that the amount of fish products used in the starting diet of these birds—though less than amounts formerly contained in such diets—was still sufficient to produce a fishy off-flavor in the turkeys killed and roasted at 14 to 16 weeks of age, whether or not aureomycin was included in the rations. No appreciable off-flavor was found in birds that grew to 26 weeks—normal roasting age—possibly because as they grew older they ate less of the starting diet and an increasing proportion of the barley which was provided along with the starting diet after 14 weeks.

### Off-Flavor from Insecticides

For several years the Bureau, in cooperation with other Department agencies, has conducted palatability tests of crop foods in research on insecticides to learn what kinds and amounts of the insecticides can be applied to plants or soil without transmitting off-flavors to foods.

These studies have indicated that off-flavors in insecticide-treated foods may not be due entirely to remaining traces of the insecticides. In peanut butter made from peanuts grown in soil containing benzene hexachloride (BHC), off-flavors characteristic of BHC could be detected when the concentration of BHC was reduced to about 1 part per million by additions of natural flavored peanut butter. Below this dilution, off-flavors were not detected. Yet in other experiments with peanut butter made from peanuts grown in soils containing BHC residues from cotton insect treatments of the previous year, the judging panel found off-flavor in several samples which, by chemical analysis, contained only 0.5 to 0.6 parts per million of BHC.

The problem of relating flavor evaluations and chemical analysis is further illustrated by additional experiments with peanut butter. A portion of oil was removed from a sample of peanut butter and sufficient BHC dissolved in the oil to provide for approximately 15 parts of the insecticide per million of the remixed oil and peanut butter. In these circumstances, no off-flavor was detected by the same trained judging panel that found characteristic BHC off-flavors in peanut butter prepared from peanuts grown in insecticide-contaminated soils and containing only 1 part per million or less of BHC, as shown by chemical analysis.

These findings emphasize that, with this insecticide at least, it is not certain whether the off-flavors in food are due to residues of the insecticide, to decomposition products of the insecticide, to changes in the food product itself resulting from physiological response of the plant to the chemical, or to several factors combined. Available methods of analysis are not adequate to provide a definite answer. Because of the complexity and widespread interest in the problem the Bureau research in this area has attracted wide interest, and staff members have presented reports on this phase of the work before a number of research and industrial groups.

### Safer Cooked Food

Bureau scientists have now applied the research method used in calculating times and temperatures needed for processing canned food to the problem of determining whether a cooking procedure such as baking or steam-kettle or double-boiler cooking is adequate to destroy microorganisms that cause food poisoning or disease. This research method has been applied to cookery in experiments with baked custard containing dried eggs, and will be further tested in other typical dishes. The method provides a new laboratory check on cooking procedures and recipes to minimize chances for food poisoning in household and institutional food preparation when bacteriological questions arise.

## TEXTILE AND CLOTHING RESEARCH

### Control of Shrinkage in Knit Goods

Studies of the relationship between structure of fabrics and their properties have enabled textile physicists of the Bureau to explain the fundamental cause of shrinkage in knit goods and to provide a new approach to the practical control of shrinkage. They have discovered that the dimensional changes of knit fabrics upon laundering are due chiefly to changes in the size and shape of the loops rather than to shrinkage of the yarns. If plain knit fabrics have good stability in laundering, the relationship of the length and width of the loops in the new finished fabric will follow parabolic curves similar to those found in the laundered fabric. Because fabrics are stretched lengthwise during knitting by the tension applied to the yarns, knit fabrics will shrink excessively unless manufacturers properly relax the fabric in the finishing which follows, and thus adjust the relationship of the length and width of the loops so as to bring them to a stable arrangement. If thus finished, most of the shrinking and stretching now commonly encountered in laundering knit goods can be averted.

### Acid Damage to Cottons Explained

Homemakers' complaints indicating widespread occurrence of a laundering problem—holes and brown spots in cotton dresses near zippers—led the Bureau to seek the cause and remedy. It was found that such damage results when a launderer, unwittingly, sets up a simple electrochemical cell which gives off acid. The chemical action is made possible when three factors combine: (1) Two dissimilar metals such as copper and aluminum, used together in many of the newer zippers; (2) a substance to conduct electricity, which may be provided by minerals in hard water, or finish on cloth or zipper, or salt which is present in many liquid starches, or some detergent not removed by rinsing; (3) water used to dampen the garment for ironing. The damage appears when a hot iron is applied to the cloth. The Bureau has advised homemakers to avoid sprinkling and rolling any laundered cotton dress if in doubt as to zipper metal. Instead, they are advised to dry quickly and press as soon as fabric is dry enough to iron; if the garment must be dampened and rolled, fold with zipper outside, keep fabric around zipper dry, and iron soon.

### Scientific Clothes Sizing

New progress has been made toward better sizing for women's clothing—a joint project with other Government agencies and the clothing industry. A basis for scientific sizing was provided when the Bureau in 1939-40 measured 14,700 women, and analyzed the data to show for the first time body sizes and proportions that predominate among women of this country. Height and numerous other dimensions used in clothing construction were recorded, as industry advised. Recently, at the request of a trade association, the Bureau has cooperated with the National Bureau of Standards to provide the

further analysis necessary to convert the data into tables suited to the apparel industry's use. The proposed system retains four familiar classifications of women's sizes—misses, women, half-sizes, and juniors; but within these classes it provides for a range of sizes for the tall, regulars, and shorts of varying hip and bust measures. The new system is now before the trade for consideration as a commercial standard. The standard deals with body measurements co-ordinated with apparel size; from the standard, industry can work out corresponding garment dimensions.

## HOME EQUIPMENT AND HOUSING

### Energy Utilization by Household Appliances

Electricity and liquefied petroleum gas—two sources of heat common in rural use—have been studied to determine the relative efficiency of utilization by household ranges, refrigerators, and water heaters. In this investigation, normal home use of ranges was simulated by preparing a series of family meals using four different sets each of gas and electric equipment, available on the market in 1951–52. Gas and electric refrigerators and water heaters were given engineering tests, under conditions that would give results applicable to normal home use.

For cooking the test meals, which included both top-of-range and oven cooking in a predetermined ratio, gas ranges (including energy for top-of-range pilots) used from 1.82 to 2.33 times as much energy in terms of British thermal units (B. t. u.) as did the electric ranges. Comparing top-of-range cooking only, gas ranges used from 1.60 to 2.34 times as much energy as did the electric ranges. Gas range ovens used from 1.89 to 2.48 times as much energy as the electric ovens.

To interpret the energy consumption figures obtained in this study in terms of costs of operation for equipment using electricity or LP gas, it is necessary, of course, to take into account not only the relative energy consumption but also the cost per unit of energy (British thermal unit). The cost per B. t. u. differs from place to place, and is generally much lower for liquefied petroleum gas than for electricity.

A report of this research "Comparative utilization of energy by household electric and liquefied petroleum gas ranges, refrigerators, and water heaters," has been published as Technical Bulletin 1073. A semitechnical report in preparation will give figures from the experiments which advisors to consumers can use in estimating the range of unit prices for electricity or liquefied petroleum gas within which the cost of operating the appliances would be about equal. Examples will show how to compute actual costs of operation under rate schedules of different communities.

### Use of Electricity on the Farm

For satisfactory operation of farm and home electrical equipment, distribution systems should give service free from interruptions and excessive voltage variations. Rapid expansion in the use of elec-

tricity and a lack of prior knowledge as to the demand characteristics of farm loads have, in many instances, resulted in faulty design of a distribution system and, hence, in inadequate service to farm families. Because a large proportion of electricity used on most farms is for operating household appliances, the Bureau shared in a Federal-State pilot study in which 16 Iowa farms were metered with recording voltmeters and ammeters at intervals throughout a year.

Factors causing considerable variation in the demand for electricity were the season of year, and whether or not the family owned an electric range or water heater. The time of peak demand on Sunday differed from other days, but otherwise the days of the week showed only slight variation in demand. The peak demand of the range coincided with the peak demand of the farm as a whole in practically all instances. The peak demand for the water heater occurred slightly later than the peak use for the farm.

On the farms studied, voltage at the meter varied widely with loads and hours of the day. When a 1,000-watt resistance load, equivalent to a toaster or hand iron, was placed across one of the 115-volt circuits of a 115/230-volt service, three-fourths of the drop in voltage between the high-line service and the meter occurred in the distribution transformer and connections. On all of the farms, the same 1,000-watt load produced in at least one of its branch circuits a voltage drop 2 to 3 times as great as that from high line to meter. Adequate farmstead wiring would reduce this drop. Results also showed that insufficient attention had been given to wiring so as to divide the load between the two 115-volt legs of the 115/230-volt circuits. Voltage conditions could be improved on many farms by balancing the loads between the circuits.

### Housing Research Conference

With a view to strengthening and expediting the cooperative housing research now under way with State Agricultural Experiment Stations, the Bureau sponsored a meeting of members of the professional staffs from various stations, who are working to develop space standards in farmhouses for food preparation and preservation. This research stems from the recent surveys which provided up-to-date statistical data showing the extent and kind of household activities of farm families in the four regions and the housing features they desire.

Since research on space requirements for household activities and storage is comparatively new, workers attempting to develop standards and to pool their findings have been greatly handicapped by lack of established procedures and terminology. The conference reached agreement on important points of technique and terminology after considering and evaluating methods adapted from other fields of research, as well as techniques that are being developed for housing studies. Helpfulness of the conference was such that the Bureau has since been asked to sponsor similar meetings for workers cooperating in research on standards for space for other kinds of activities or for storage.

## ADVANCING NUTRITION PROGRAMS

### Nutrition Conference

The Bureau took leadership in planning and conducting a National Food and Nutrition Institute in December 1952. This conference brought together approximately 400 persons responsible for phases of the varied food and nutrition programs throughout the United States to discuss mutual problems, to pool up-to-date information, and to gain ideas for making current programs more effective. Joint sponsors of the 3-day conference were agencies within the U. S. Department of Agriculture, the U. S. Public Health Service, and the Interagency Committee on Nutrition Education and School Lunch. A report of proceedings containing papers and summaries of the discussions by nutritionists, physicians, and leaders in many fields of education and research has been published.

Better nutrition was given much credit for many of the improvements in health—increases in height and weight for age of children; longer life spans; control of such dietary deficiency diseases as scurvy, rickets, and pellagra; decline in maternal and infant deaths; and downward trends in mortality from certain infections, particularly tuberculosis. More than one speaker made the point that gains in nutritional health represent an economic asset to families and to the Nation. For the future, the need was stressed for nutrition research and education to aid the obese, the aged, and all those whose diets should be improved.

Research of the Bureau provided information to the conference on the nutritional significance of trends in the national diet.

### Nutrition Program Aids

Since 1949, when the Bureau was designated the Department's coordinator for nutrition services, it has prepared an informal periodical to enable nutrition leaders throughout the country to exchange news of their work and ideas for others' use. The periodical *Nutrition Committee News* is serving teachers, extension and public health workers, doctors, nurses, and others concerned with nutrition education. In a readership survey, the following topics were rated highest in value among those recently featured: Activities related to nutrition for the aging; diets of children; how to change food practices; ways to improve nutrition teaching; and positive steps to provide correct food information.

As further program aids and guides to trainees from other countries, the Bureau prepared a new edition of a report describing food and nutrition services of Federal and quasi-official agencies of the United States, and on behalf of the Interagency Committee on Nutrition Education and School Lunch, issued a booklet briefly explaining the committee's goals and describing activities of the agencies which are represented on this committee.

## SUMMARY OF RESEARCH PUBLICATION

During the year the Bureau published or sent to press 43 new popular or technical bulletins which were issued through the Government Printing Office or the Department, and 66 technical or semitechnical articles for scientific or trade journals. Through popular-style publications, press releases, popular articles, and radio and television broadcasts, new research findings of immediate practical application to homemakers were brought to the attention of extension leaders and teachers, women's page editors and food editors of newspapers and magazines, those responsible for planning women's radio and television programs, and to home economists in business.

One responsibility of the Bureau is to provide research-based information in a form suitable for use by extension and other group leaders in their educational programs. Among new teaching aids produced in the year are a booklet bringing together points to consider in selecting women's coats and suits, a publication on construction of window curtains, a leaflet describing basic cooking methods and recipes for preparing rabbit meat, two filmstrips giving up-to-date methods on home freezing of fruits and vegetables, a chart book and filmstrip on family living prepared for the Department's Agricultural Outlook Conference, and a bulletin on pork containing dependable facts for consumer education—another one in the series on the buying and use of individual food commodities.

Cooperating in the Department's program to bring existing publications up to date, the Bureau, during the year, revised several bulletins. One on selection and use of washing machines reflects recent research in household equipment. Bulletins on use and care of pressure canners, planning the bathroom, and use of cut-outs to help in house planning were also revised.

A filmed picture visit to the Bureau's laboratories and workrooms, "Research for Better Living," was revised and reissued in shorter form. Additional prints have been made available in regional film libraries so that the film may be more readily borrowed by colleges and extension groups. Marking the 30th anniversary of the founding of the Bureau in 1923, an illustrated booklet was published which described the research program and some of the accomplishments of the Bureau over the years. Designed primarily to stimulate interest in home economics research among college students, this publication will serve also to answer the many requests for information about the Bureau's program of work.

Indicative of the widespread interest in the Bureau's research and its publications were the 2,600 visitors from 68 countries and the requests during the year for about 4,700,000 copies of its publications distributed through the Government Printing Office.

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